

Table 11.3 Quantified Targeted Benefit Change

Table 11.3 tables provide information about some of the data used to develop the reference condition, the Quantified Targeted Benefit and the Quantified Targeted Benefit Change associated with Sub-Region 11. The QTBC is the quantified value of the required change or improvement in water flow, quantity, or quality at specific places and times, necessary to achieve the Targeted Benefit.

Column (8), Data Source: provides the citation for the data use in the Reference Condition, Quantified Targeted Benefit, and Targeted Benefit Change columns. The same citation codes (ERPP, Core, 303d, etc.) are used in these three columns as in Column 7 for the source of Quantified Targeted Benefits.

- 15) **Reference Condition:** is the quantitative representation of the current state of the water resource that must be affected to achieve the Targeted Benefit. For example, the Reference Condition (RC) for TB #113, see Table 11.3, (Provide flow to improve aquatic ecosystem conditions in the Stanislaus River) would be the existing flows in Bear Creek during specified interest times.
- 16) **Quantified Targeted Benefit:** is the numerically quantified expression of the given Targeted Benefit as defined above. For example, for TB #113, see Table 11.3, (Provide flow to improve aquatic ecosystem conditions in the Stanislaus River), the Quantified Targeted Benefit is the desired flow condition(s): In critical, dry, and below-normal years, the base flows below Goodwin Dam should be 200 to 300 cfs. There should be a flow event of 1,500 cfs for 30 days in April and May.
- 17) **Quantified Targeted Benefit Change:** is the water flow timing, quality, or quantity change needed to achieve the Targeted Benefit as described above. The QTBC is determined in most cases by taking the difference between the Reference Condition and the Quantified Targeted Benefit as follows:

$$\text{Quantified Targeted Benefit Change} = \text{Quantified Targeted Benefit} - \text{Reference Condition}$$

Columns (9), Data Availability: represents a summary of the availability of quantitative information for the Reference Condition, Quantified Targeted Benefit, and Quantified Targeted Benefit Change columns. The following categories are used to describe data availability:

- **Not available:** quantitative data is nonexistent or severely limited in scope. For example, there are a few anecdotal references for the Targeted Benefit “Reduce temperatures to enhance and maintain aquatic species populations” but they have yet to be established through rigorous research or practice.
- **Insufficient:** through conferences with Ag WUE technical specialists, data and studies have been cited, but quantitative data has not yet been found.

range of base flows for various year types. Through conferences with aquatic ecosystem specialists, we have determined that these flow targets were developed as part of an adaptive approach that did not have a firm scientific foundation.

- **Unproven – precise:** accepted quantitative data exists, but no supporting documentation is available to justify precise quantitative values. For example, the TB #125, see Table 11.3, (Reduce temperatures to enhance and maintain aquatic species populations) calls for less than 56 degrees Fahrenheit from October 15th to February 15th, and less than 65 degrees Fahrenheit from April 1st to May 31st. Although no supporting documentation has been provided for this acreage target, this is considered an accepted value among aquatic specialists.
- **Proven – precise:** precise quantitative values and supporting documentation are available for these Targeted Benefits. For example, TB #121, see Table 11.3, (Reduce pesticides to enhance and maintain beneficial uses of water in the Stanislaus River) calls for reducing diazinon. In this case, the target concentration has been established and documented by the US EPA.

Column (10), Range QTB of Values: provides a summary of the range of Quantified Targeted Benefit Change values. In most cases a range of values will be given. More detail on the derivation and range of values is provided in the Detail section for each TB in each Sub-Region (see Detail TB #s, below).

Column (11), Specific Time-Frame: identifies the specific year type and/or time of year that the Quantified Targeted Benefit is needed (e.g. specific months, season, year type, etc.). For example, for TB #123, see Table 11.3, (Reduce salinity to enhance and maintain beneficial uses of water), the specific timing is April through August and from September through March.

Table 11.4 Quantifiable Objectives

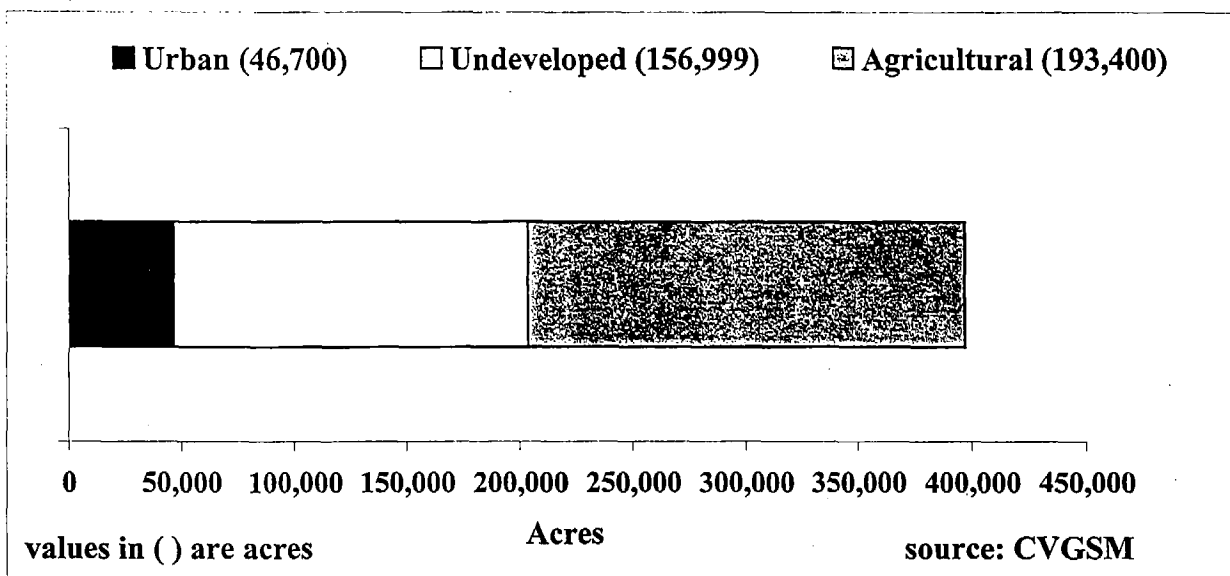
Column (12), Range of Available Agricultural Potential: states the volume of water that is available after improving the farm and district irrigation efficiency from existing efficiency to improved efficiency values. The range shown in this column is a summary of the values provided in the Details 113, 121, and 127. For example, for TB# 113, the Available Agricultural Potential ranges from 73 to 268 TAF/year. The higher value in the range would result from a higher level of investment in improving irrigation efficiency. The methodology used to determine values of the Available Agricultural Potential for several months, year types, and investment levels are provided below.

Column (13), Quantifiable Objective: represents the practical, cost effective (from a State-wide standpoint) contribution that can be made to the given Targeted Benefit through changes in agricultural water management. Four levels of Quantifiable Objectives are computed for each Targeted Benefit. Each level represents a different investment in on-farm and district water management practices to change the given flow path. The range of contribution (in TAF/year) and unit cost (in \$/AF. year) for each of the four levels presented in this column.

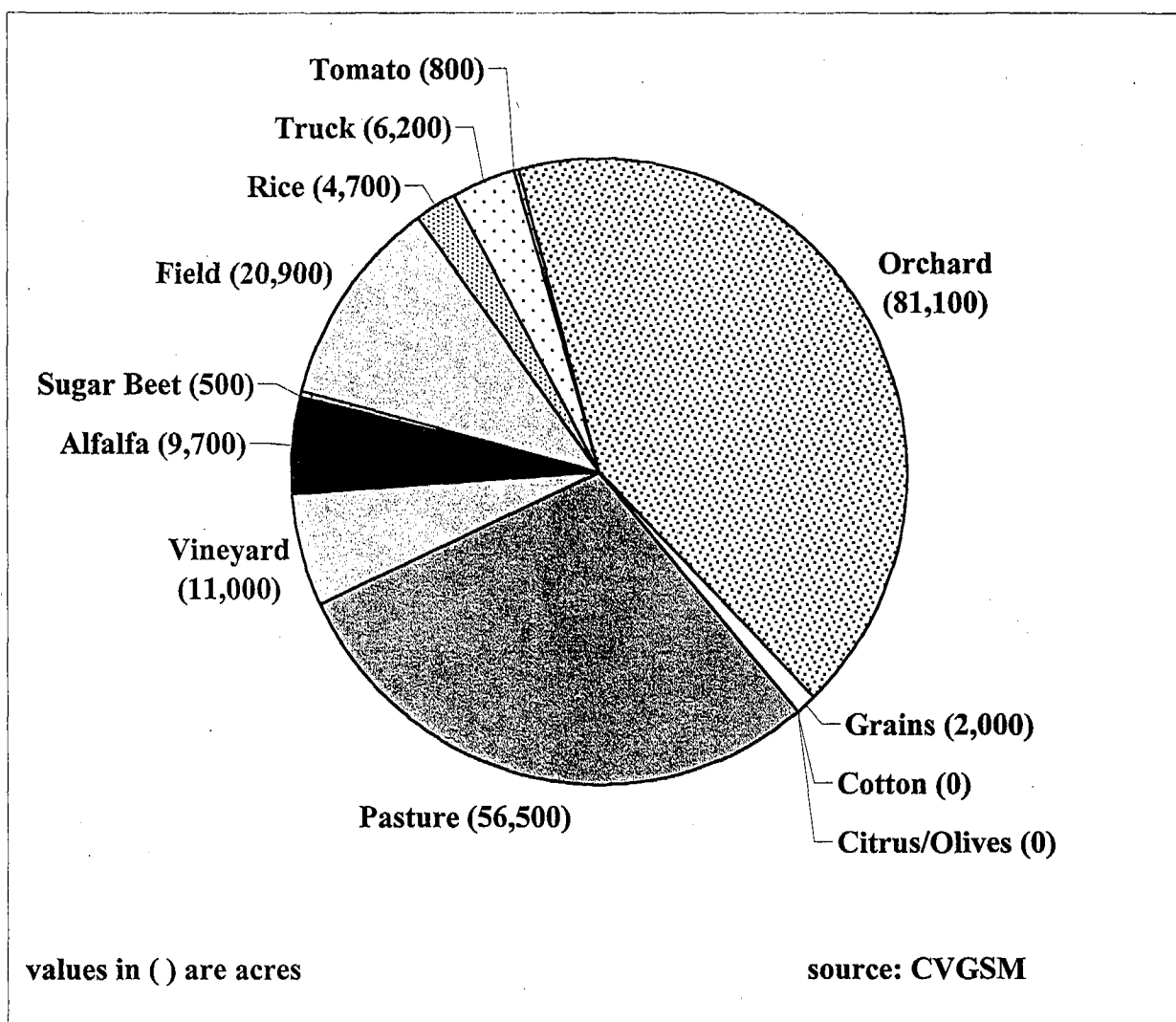
Table 11.5. Affected Flow Paths and Possible Actions

Column 14), Affected Flow Paths: A Flow Path is the course that water follows between entering and a given water balance area. The Flow Paths considered in the Quantifiable Objective methodology are shown in Figure 4. *Column (14)* indicates which flow paths would need to be changed to achieve the Quantifiable Objective.

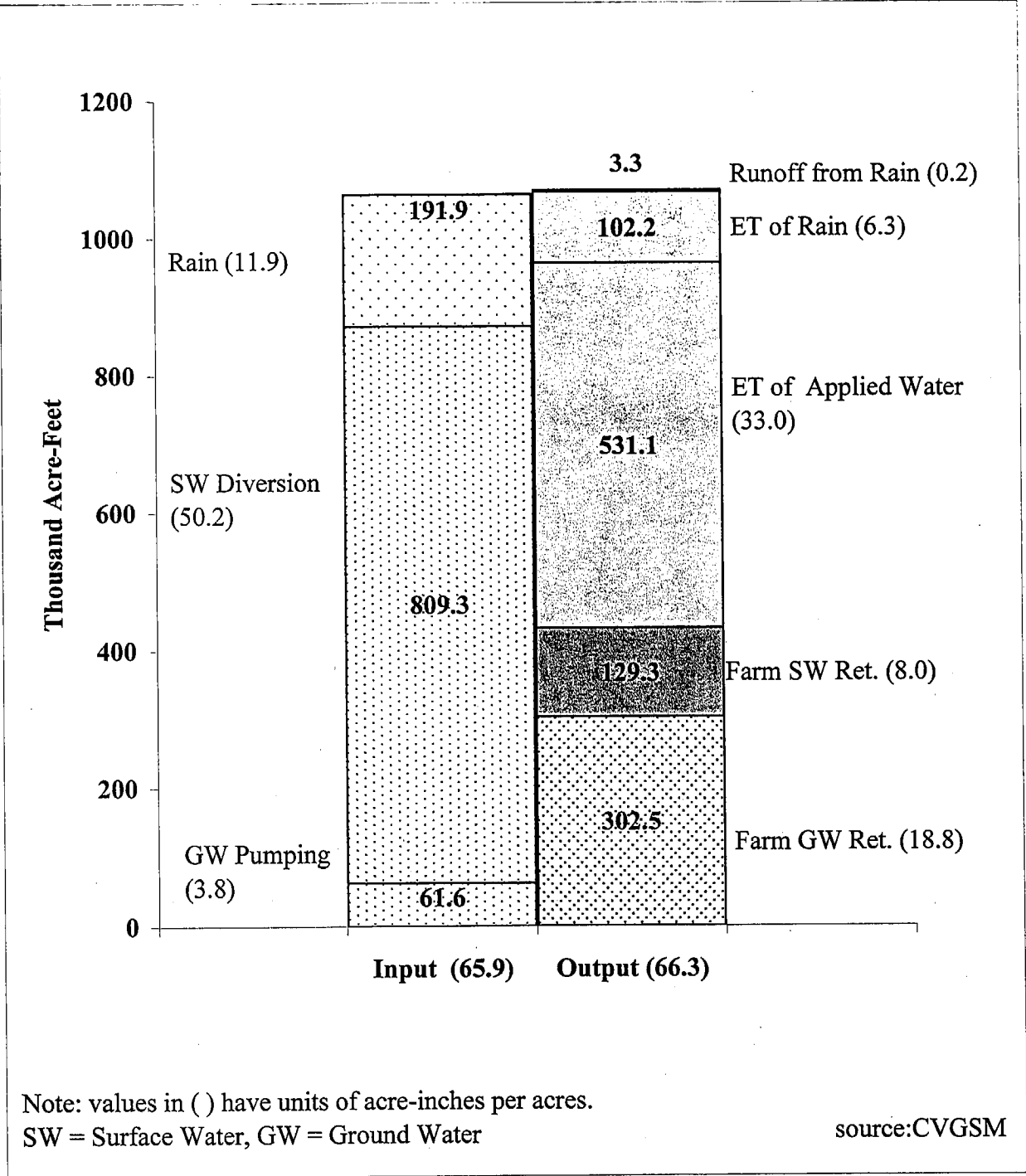
Column 15), Possible Actions: There are many possible ways to make the flow path changes described in Column 14. The possible actions listed in Column 15 are a sample of practices that growers or water suppliers could employ to generate the desired changes. These possible actions are only a sample and do not represent an exhaustive list of practices or prescriptive requirements.



**Figure 11.1 Land Use, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River.**



**Figure 11.2 Cropping Pattern, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River.**



**Figure 11.3. Overall Water Balance, Average Year, Sub-Region 11,
 Eastern San Joaquin Valley above Tuolumne River.**